

The Adjustment of China's Industrial Structure after 1978

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Preface

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Abstract

China's aggregate economic activity has increased and the national economy has developed rapidly since the reform and opening-up policy was carried out after 1978. The GDP growth rate has kept over 10 percent since 2004. It is really a success taking consideration of the previous poverty and lagging industry. This active change is mainly due to the upgrading of the industrial structure.

The first part of this thesis mainly described the gradual changes in China's industrial structure. The adjustment after 1978 can be divided into 5 stages. The first stage was from 1978 to 1984. The focus point of adjustment in this period was to develop primary industry to release the food stress. Among the three main industries, the government gave top priority to primary industry and light and textile industry and promoted the development of infrastructure and basic industry. As to the internal structure of primary industry, the government provided fund and policy support to encourage farmers to engage in forestry, animal-breeding and fishery.

The second stage was from 1985 to 1992. The main task in this period was to develop non-agricultural industries. For primary industry, the most important policy was to promote the development of labor and skill intensive industry and the ratio of crops farming still kept the downtrend. For secondary industry, the main part of the structure was changed from raw material industry to processing and assembly industry. The light industry still got the priority to develop comparing to the heavy industry in this period. For tertiary industry, the government gave priority to transportation and communication and new industry was highly valued.

The third stage was from 1993 to 2000. The dominant position of secondary industry was reestablished and strengthened in this stage. The notable feature of this period was that the ratio of secondary industry increased rapidly with the strengthening of the construction of infrastructure industry such as energy, transportation and communication. The government made policy to proceed with the construction of infrastructure of energy, transport and communication. Industrial departments such as electricity, steel, machinery, motor, shipbuilding, chemical, electronics, building materials became the main driving force of

national economic development. In the urban areas, the development of business and catering service industry was preceeded. In the rural areas, policies were made according to their local circumstances and combined with the industrialization of agriculture and the construction of small towns. The regional imbalance also got improvement.

The fourth stage was from 2001 to 2005. The tenth five-year plan was carried out in this period and it was the most important period for the strategic adjustment of economic structure. The main guide-line was that the fundamental position of primary industry should be strengthened and the comprehensive development of rural economy should be promoted. The overall quality and international competitiveness of China's secondary industry, which was market-oriented and took enterprises as the main bodies, were improved by the technological development. The great development of social production capacity was gained by the stimulation of information to industrialization. The quality and efficiency of traditional service industries such as commerce, transportation and municipal service were transformed by the use of modern management methods and service technology.

The fifth stage was from 2006 to now. The eleventh five-year plan was carried out during this period. The main policies here were to take the development of comprehensive agricultural production capacity as the primary task, to change the growth mode and to strengthen its fundamental position. The main requirements of new-style industrialization were to adjust the production structure, the organizational structure of enterprises and industrial layout so that the overall technical level and competitiveness could be improved. The government tried their best to promote the coordinated regional development and reduce the energy consumption.

The second part of this thesis compared China with India in the aspect of changes in industrial structure. China and India are neighbors and have many similarities in the aspect of national basic conditions. They both have a large population and a weak economic background. They were almost at the same starting line in the process of industrialization and social and economic modernization. Although China and India adopted similar economic development strategy at the begining of their national independence, their industrial structures differed greatly. China followed the traditional path of industrialization that was following the procedure of primary-secondary-tertiary and took secondary industry especially manufacturing industry as the core of economic development at the present stage. India's

economic growth pattern was quite different from other countries in Asia especially China. It mainly relied on domestic market instead of export, on consumption instead of investment, on tertiary industry instead of secondary industry, on high technology instead of low-skilled manufacturing. India's service industry played a very important role in Indian economic growth.

Contents

PREFACE	3
ABSTRACT.....	4
CONTENTS	7
1. THE EFFECTS UPON THE INDUSTRIAL STRUCTURE OF THE REFORMS AND OPENING-UP OF CHINA'S ECONOMY	9
1.1 BACKGROUND.....	9
1.2 FIRST STAGE: 1978-1984.....	10
1.2.1 <i>Changes between three industries.....</i>	<i>10</i>
1.2.2 <i>Internal adjustment</i>	<i>12</i>
1.2.3 <i>The reform and opening-up policy.....</i>	<i>13</i>
1.3 SECOND STAGE: 1985-1992.....	14
1.3.1 <i>Changes in primary industry.....</i>	<i>15</i>
1.3.2 <i>Changes in secondary industry.....</i>	<i>16</i>
1.3.3 <i>Changes in tertiary industry</i>	<i>18</i>
1.4 THIRD STAGE: 1993-2000.....	21
1.4.1 <i>Changes in primary industry.....</i>	<i>22</i>
1.4.2 <i>Construction of infrastructure.....</i>	<i>23</i>
1.4.3 <i>Changes in secondary industry.....</i>	<i>25</i>
1.4.4 <i>Changes in tertiary industry</i>	<i>28</i>
1.4.5 <i>Changes in regional economic structure</i>	<i>29</i>
1.5 FOURTH STAGE: 2001-2005	29
1.5.1 <i>Changes in primary industry.....</i>	<i>30</i>

1.5.2	<i>Changes in secondary industry</i>	32
1.5.3	<i>Changes in tertiary industry.....</i>	34
1.5.4	<i>The infrastructure construction.....</i>	34
1.5.5	<i>Changes in regional structure.....</i>	35
1.6	FIFTH STAGE: SINCE 2006	36
1.6.1	<i>Building a new socialist countryside.....</i>	37
1.6.2	<i>Promoting the optimization and upgrading of industrial structure</i>	38
1.6.3	<i>Rapid growth of tertiary industry.....</i>	39
1.6.4	<i>Promoting the coordinated regional development.....</i>	39
1.6.5	<i>Reduction of energy consumption</i>	40
1.7	SUMMARY.....	40
2.	A STRUCTURAL COMPARISON BETWEEN CHINA AND INDIA	43
2.1	THE COMMON FEATURES OF ECONOMIC DEVELOPMENT	43
2.2	DIFFERENT PATH OF INDIA’S STRUCTURAL TRANSFORMATION	45
2.2.1	<i>India’s industrial model</i>	45
2.2.2	<i>India’s service industry.....</i>	46
2.2.3	<i>India’s primary industry.....</i>	49
2.2.4	<i>India’s secondary industry.....</i>	50
2.3	COMPARISON BETWEEN CHINA AND INDIA	52
2.3.1	<i>Differences in trade structure.....</i>	54
2.3.2	<i>Differences in infrastructure construction</i>	54
2.3.3	<i>Differences in overall economic structure</i>	55
REFERENCE	57

1. The effects upon the industrial structure of the reforms and opening-up of China's economy

China's aggregate economic activities have increased and national economy has developed rapidly since the reform and opening-up policy was initiated after 1978. The GDP growth rate has kept over 10 percent ever since 2004 (from the speech of Xie Fuzhan on the Council press conference, 2008). It is really a success, especially comparing to the economic dislocation after 3-year natural calamities (would be explained below). This can be mainly attributable to the fundamental changes which have taken place in China's industrial structure. A lot of long standing issues, such as the disharmony of industrial property relation, imbalance between supply and demand and so on have been solved basically.

1.1 Background

China's economy was badly destroyed by China's war of resistance against Japan and the war of liberation. In the face of backward industry and economic blockade, the primary mission of the New China founded in 1949 was to build up a relatively complete modern industry system. The policy pursued in that period followed the Soviet pattern of industrialization with strong emphasis on building up heavy industry and with no emphasis on trade as key to development. The first five-year plan of large-scale heavy industrial construction was started from 1953.

The Great Leap Forward started from 1958 caused a serious imbalance in industrial structure. It was intended to increase the production of steel and to raise agricultural production to twice 1957 levels. The tendency towards boasting and exaggeration in all aspects especially in grain yield prevailed. During the Great Leap Forward, farming was organized into communes and the cultivation of private plots forbidden. This forced collectivisation substantially reduced the incentives for peasants to work well. Iron and steel production was identified as a key requirement for economic advancement. Millions of peasants were ordered away from agricultural work to join the iron and steel production workforce. (Great Chinese Famine, Wikipedia, 2006) These practises led to devastating destroy to most of national production goods. The absolute productivity and relative proportion of agriculture declined significantly.

Most products even could not meet the basic need of society. The substantial increase in urban labor force resulted in short supply of housing and life's necessities. The birth rate declined sharply and the death rate increased due to the starvation. Food was in desperate shortage, and production fell dramatically. The forest was cut excessively and large areas of farmland were barren. What was worse, China suffered adverse weather conditions such as droughts and floods in this period. By the end of the Three Years of Natural Disasters, which was the direct result of the failed Great Leap Forward campaign, an estimated 20 million people had died from widespread famine (Cultural Revolution, Wikipedia, 2009).

The Cultural Revolution started in 1966 continued the guidelines of “taking steel as the key link” (Liu XinMin, 2001). During the Cultural Revolution, much economic activity was halted, with "revolution", regardless of interpretation, being the primary objective of the country (Cultural Revolution, Wikipedia, 2009). The proportion of primary, secondary and tertiary industry in GDP changed from 37.3%, 32.3% and 30.4% in 1965 to 28.2%, 31.6% and 40.2% in 1975 (Liu XinMin, 2001). The development of primary industry declined seriously. The development of commercial, catering and services industry was suppressed to the minimum. The political troubles destroyed the production construction, resulting in huge material losses directly. The pace of economic growth slowed down and the economic efficiency declined significantly. People still suffered the lack of food and daily necessities.

1.2 First stage: 1978-1984

China's economy recovered from the most severe setback and biggest loss made by Great Leap Forward and Cultural Revolution and full-scale country reform was carried out during this period. The main feature of changes in this stage was that the primary industry got rapid growth and the proportion of it in GDP increased quickly. Moreover the reform and opening-up policy started in this period brought new life into China's economy.

1.2.1 Changes between three industries

The central guidelines in this period were to improve the serious imbalance of property relations of the national economy that were the excessive development of heavy industry and

the seriously lacking growth of primary industry and to reform the outdated economic system.

The government gave top priority to primary industry and light and textile industry, promoted the development of infrastructure and basic industry, compressed the scale and reduced the growth rate of heavy industry. The government also provided policy support of the distribution of resources to primary industry which led to an increase in agricultural productivity. All these methods promoted the development of primary industry and greatly improved the imbalance between industry and agriculture.

Table 1 Composition of GDP in China (%)

Data in this table are calculated at current prices

Year	GDP	Primary	Secondary	Industry	Construction	Tertiary
1978	100.0	28.2	47.9	44.1	3.8	23.9
1979	100.0	31.3	47.1	43.6	3.5	21.6
1980	100.0	30.2	48.2	43.9	4.3	21.6
1981	100.0	31.9	46.1	41.9	4.2	22.0
1982	100.0	33.4	44.8	40.7	4.1	21.8
1983	100.0	33.2	44.4	39.9	4.5	22.4
1984	100.0	32.1	43.1	38.7	4.4	24.8

Source: <China statistic yearbook (2007)>

As can be seen from table 1, the ratio of primary industry reached 32.1% in 1984 and increased by almost 4% comparing to 28.2% in 1978. Secondary industry decreased by about 3% while tertiary industry increased by 0.9% in the corresponding period. The average annual growth rate of value added reached 14.5% for primary industry and exceeded the 10% of secondary and 12.7% of tertiary industry (the State Development and Reform Commission, 2005). Consumer goods industries such as textile and light industry developed

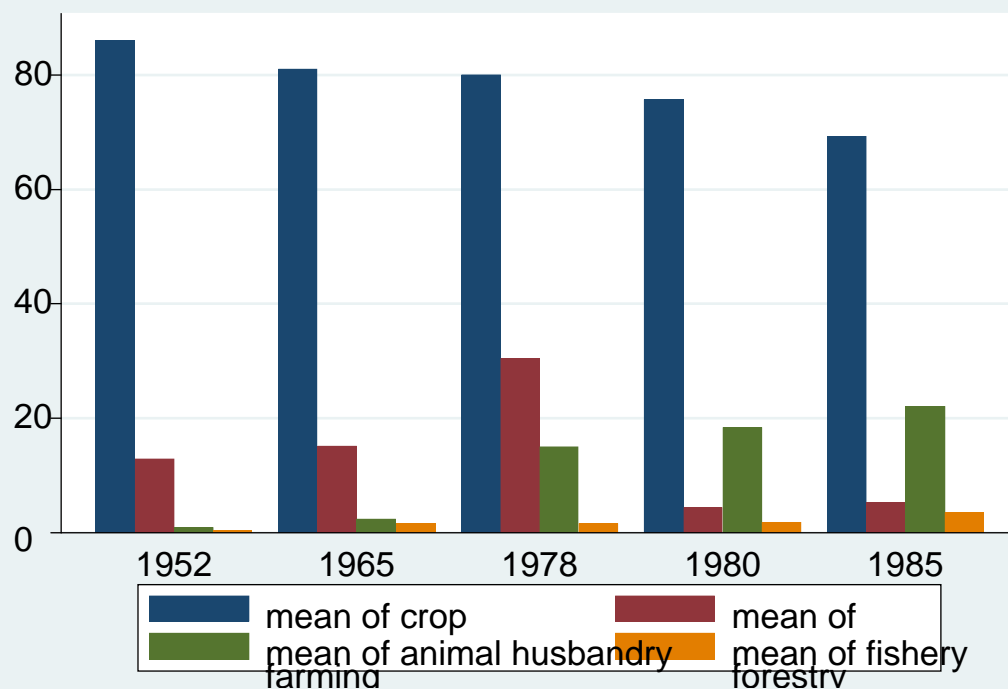
greatly and the market demand were satisfied during this period. The heavy industry was under adjustment simultaneously and its ratio decreased a lot.

1.2.2 Internal adjustment

There was also major reforms within agriculture. Before the economic reform crop farming was always the leader in primary industry and the others developed very slowly because of the low productivity.

The changes in the internal structure of agriculture became one of the main tasks after 1978. The government provided funds and policy support to encourage farmers to decrease the cultivation area of grain crops and increase the area of cash crops and to develop animal husbandry and fishery actively. The quality of crops varieties was improved. Although the area of grain crops decreased, the gross grain output increased due to the high growth rate of yield per mu and high-crops quality. The government also established new law to stop the excessive cutting and made quota to yearly logging.

Table 2 The changes of Chinese rural economic structure (%)



The share of crop farming decreased gradually after 1978 from table 2. The high share of forestry before 1978 were mainly due to excessive cutting rather than deep processing of timber and the diversified economy of undergrowth. Such phenomenon was improved obviously after 1978. Moreover, the share of animal husbandry and fishery increased progressively.

The changes in agricultural output was the result of the changes in demand and production structure. Moreover, the relieving of price control on agricultural products was the direct incentive to drive farmers to change from crop planting to other agricultural industries.

The gross domestic product experienced a great-leap-forward development after the economic reform. GDP in 1980 was almost twice as much as in 1970 (Government Work Report of the State Council, 1981). The major role of primary industry in pulling economic growth was undeniable. However, it was really unusual that the ratio of agriculture increased so rapidly in the process of industrialization. But it was just to correct the mistake that primary industry could not get enough development due to the Great Leap Forward and Cultural Revolution mentioned above. So this situation was compensatory and temporary and the ratio of agriculture decreased gradually from 1985.

1.2.3 The reform and opening-up policy

The reform and opening-up started in 1978 and referred to the program of economic reforms called "Socialism with Chinese characteristics". The goal of it was to generate sufficient surplus value to finance the modernization of the Chinese economy. (Economic reform in the People's Republic of China, Wikipedia)

The first reform in the late 1970s and early 1980s consisted of opening trade with the outside world, instituting the household responsibility system in agriculture, by which farmers could sell their surplus crops on the open market, and the establishment of Town and Village Enterprises. (Economic reform in the People's Republic of China, Wikipedia) The household responsibility system in agriculture was that the farmers could keep all their products except for the quota that should be handed in to the nation. The open market also allowed the free flow of commodity. All these things mobilized the farmers' enthusiasm of the production and improved the people's standard of living. An open door policy was introduced by which

the PRC began to allow international trade and foreign direct investment. These initiatives immediately increased the standard of living for most of the Chinese population and generated support for later, more difficult, reforms (Economic reform in the People's Republic of China, Wikipedia).

The Special Economic Zones were established in ShenZhen, ZhuHai, XiaMen and ShanTou in 1979. These coastal cities had regional advantages comparing to other inland cities. They helped to expand foreign trade, attract foreign investment and technology and increase job opportunities and then drive the development of other inland cities.

1.3 Second stage: 1985-1992

The rapid development of non-agricultural industries was the main result of the adjustment in this period.

Positive effects were achieved after the adjustment of the first stage. The gross domestic product in 1985 doubled comparing to that in 1980 (Government Work Report of the State Council, 1986). Primary and consumer goods industry developed so quickly that people were provided with adequate food and clothing. However, the main methods in the first stage were to encourage the concerted development of primary industry and then relieved the stress of short-comings. The situation of structural imbalance was still serious. Moreover, the improvement of labor productivity in agriculture released a huge amount of rural labor force. The contradiction between employment pressure and the insufficient development of tertiary industry was on the slide (the State Development and Reform Commission, 2005). In view of this circumstance, the government formulated the seventh five-year plan to proceed with the improvement of the imbalance and start to pay attention to the upgrading of the industrial structure.

The reform and opening-up of the late 1980s and early 1990s focused on creating a pricing system and decreasing the role of the state in resource allocations. This second phase of reform occurred in the 1980s was aimed at creating market institutions and converting the economy from an administratively driven command economy to a price driven market economy. This difficult task of price reform was achieved using the dual-track pricing system, in which some goods and services were allocated at state controlled prices, while

others were allocated at market prices. Over time, the goods allocated at market prices were increased, until by the early-1990s they included almost all products. In the late 1980s the Chinese economy was still transitioning steadily, as it moved cautiously away from central planning and gradually adopted some more of the institutions and mechanisms of a market economy. (Economic reform in the People's Republic of China, Wikipedia)

1.3.1 Changes in primary industry

In respect of primary industry, its growth would more and more rely on the improvement of growing environment such as circumstances and soil condition. But this improvement was an incremental process and this situation would absolutely influence the growth rate of agriculture. Moreover it was really very abnormal that primary industry occupied such a heavy proportion in GDP during the process of industrialization. So the central task in this period was to reduce its share in GDP while keep its gross growth at a steady pace (the State Development and Reform Commission, 2005).

To promote the development of labor and skill intensive industry was the most important policy not only in this period but also the subsequentness. Scarce agricultural acreage due to vast population and limited farmland was China's basic condition and also the starting point of policy making. In view of this, it was necessary to adjust the relationship between food supply and trade structure, and promote resources to flow into export-oriented agriculture. Food pressure was released to a certain extent and great amount of foreign exchange was gotten by means of exporting labor- and skill-intensive agricultural products such as wheat, cotton, soybean and so on (reference site: <http://www.wenhei.com/docment/1182694>).

In consideration of the internal structure of agriculture, the ratio of crop farming still kept the downtrend. Productions with high price and good economic returns such as fruits, vegetables and cotton were extensively cultivated. From table 3, the output of fruits in 1992 doubled that in 1985. Lots of scientific and technical payoffs, such as fine varieties, plastic mulching and stylized cultivation, were popularized (Zhou ZhiXiang & Zeng BaoYou, 1995).

The rapid increase of the internal share of husbandry and fishery in primary industry was closely related to the increase in national income. With the rapid development of national economy, people's living standards continued to be improved and the demand for meat and

fish expanded significantly. This demand stimulated the development of husbandry and fishery. At the same time, China's agricultural products entered national market after opening-up. The exports of meat and marine products occupied a relatively large proportion in the export of agricultural products. This was also an important reason for the rapid growth of husbandry and fishery industries.

Traditional family animal-breeding was changed into commercial husbandry with large scales gradually. The application of scientific methods such as epidemic prevention and compound feed obviously increased the amount of productions.

Diversified forestry, not only timber but also undergrowth resources such as potherb, mushroom and wild animals, was popularized. Afforestation was carried out and the quality of it was given close attention.

In the aspect of fishery the technique of cultivation and processing of marine, freshwater fish and shellfish, such as oysters, clams, salmon, and trout were developed (reference site: <http://www.wenhei.com/document/1182694>).

At the end of this stage, the proportion of primary industry in GDP decreased by almost 7%, from 28.4% in 1985 to 21.8% in 1992. On the contrary, the average annual growth rate of value added of primary industry achieved about 14.5%. The structural adjustment got some progress, that was to reduce the share of agriculture in the increase of GDP while keeping its rapid and rational growth. The reduction in GDP did not mean remaining stagnant. The total gross output value in 1992 was 908.5 billion RMB, almost triple that of 1985. However, the basis of primary industry and the capacity to combat natural adversities were still weak and the peasants' income increased very slowly. It was really a fundamental structural contradiction in national economy and would influence every aspects of economic life. (Data in this paragraph from the National Bureau of Statistics, 2007)

1.3.2 Changes in secondary industry

Inside secondary industry, the main part of structural transformation was from raw material industry to processing and assembly industry. The processing stage deepened quickly.

The light industry still got the priority relative to heavy industry in this period. The guideline to develop regional economies was to follow the stratified development strategy (the State Development and Reform Commission, 2005). The production and marketing of industrial products was no longer limited to one country but geared to international standards. By the proceeding of opening-up, the production structure of foreign trade changed from primary products to manufactured goods. Hence, the processing industry got rapid development.

The overquick rise of process industry during the period from 1984 to 1987 was mainly induced by overlarge investment demand and supported by large amount of imported raw materials (the State Development and Reform Commission, 2005). But this situation could not be maintained for a long time. In face of the inadequate supply of energy and raw materials and the great incapacity of transportation, the government made policy to properly control the rapid development of process industry. Moreover this change was favorable for coordinating the relationship between energy, raw material industry and process industry.

The production areas of consumer goods industry were expanded. The supply of clothing and high and durable consumer goods increased. New species and pioneer product were developed and new production categories were exploited. The consumer goods industry was given the priority in most respects such as loan, use of foreign exchange, energy, supply of raw materials and so forth. Food, clothing and durable consumer goods industry were also prioritized to drive the better development of the whole consumer goods industry.

Energy industry took electricity as development centre and developed thermal power generation and waterpower. From table 3 next page, the output of electricity in 1992 almost doubled that in 1985. The exploration and exploitation of coal, crude oil and natural gas sources were reinforced. The improvement of the supporting facilities and extension was given close attention.

Raw material industry made effort to increase the output of key projects and the product varieties.

Civil construction industry developed rapidly and was promoted to be the mainstay industry of national economy.

The construction of railway, highway, water transport and air transport also developed quickly. Under this consideration, motor industry was made to be one of the important mainstay industries.

At the end of this stage, the ratio of secondary industry in GDP increased by 0.5%, from 42.9% in 1985 to 43.4% in 1992. The average annual growth rate of value added was 17% in 1992. But the situation of the similarity of regional structure did not get enough improvement. The poor economic benefit also could not be completely improved. (Data in this paragraph from the National Bureau of Statistics, 2007)

Table 3 Per Capita Output of Major Industrial and Agricultural Products (kg)

Year	Grain	Cotton	Fruits	Coal(ton)	Crude oil	Electricity(kwh)	Crude steel
1985	360.70	3.94	11.07	0.83	118.83	390.76	44.52
1986	367.00	3.32	12.63	0.84	122.51	421.36	48.93
1987	371.74	3.92	15.39	0.86	123.74	458.75	51.92
1988	357.72	3.77	15.12	0.89	124.41	494.90	53.95
1989	364.32	3.39	16.38	0.94	123.04	522.78	55.05
1990	393.10	3.97	16.51	0.95	121.84	547.22	58.45
1991	378.26	4.93	18.91	0.94	122.52	588.77	61.70
1992	379.97	3.87	20.95	0.96	121.97	647.18	69.47

Source: <China statistic yearbook (2007)>

1.3.3 Changes in tertiary industry

The quantity of employment and total output value of tertiary industry increased to some extent after 1949. But the process was tortuous. The ratio of tertiary industry in GDP was 28% in 1952 but decreased to 24.8% in 1984. Its quantity of employment was only 16.1% in the total employment in 1984. The main problems of tertiary industry at that time were the

slow increment speed, poor economic benefit and management. (Data in this paragraph from the National Bureau of Statistics, 2007)

The reasons for these were various. The most important reason was the low labor productivity and development level of primary and secondary industry since only a gradual increase of labor productivity could bring more labor force to tertiary industry. Moreover, the rapid development of primary and secondary industry could promote the process of socialization of production and consumption level. Second, there was great imbalance between different regions such as the coastal and the inland cities. Third, internal industrial imbalance was also very serious. The development was mostly limited to traditional business such as catering trade and service industry. New-style industries such as insurance, advisory, advertisement and tourism had barely started.

As for the regional imbalance, the most important method was to take actions that suited local circumstances. The infrastructure in big cities was improved to relieve traffic congestion and improve the service facilities. For rural areas, township enterprises were induced to change their economic and production patterns to achieve the coordinated development of sideline and tertiary industry. Township tertiary industry such as rural commerce, transportation, post and telecommunications, catering service and other service industries was developed actively. (Li JiangFan & Zeng GuoJun, 2003). All regions made characteristic policy on the basis of their practical situations.

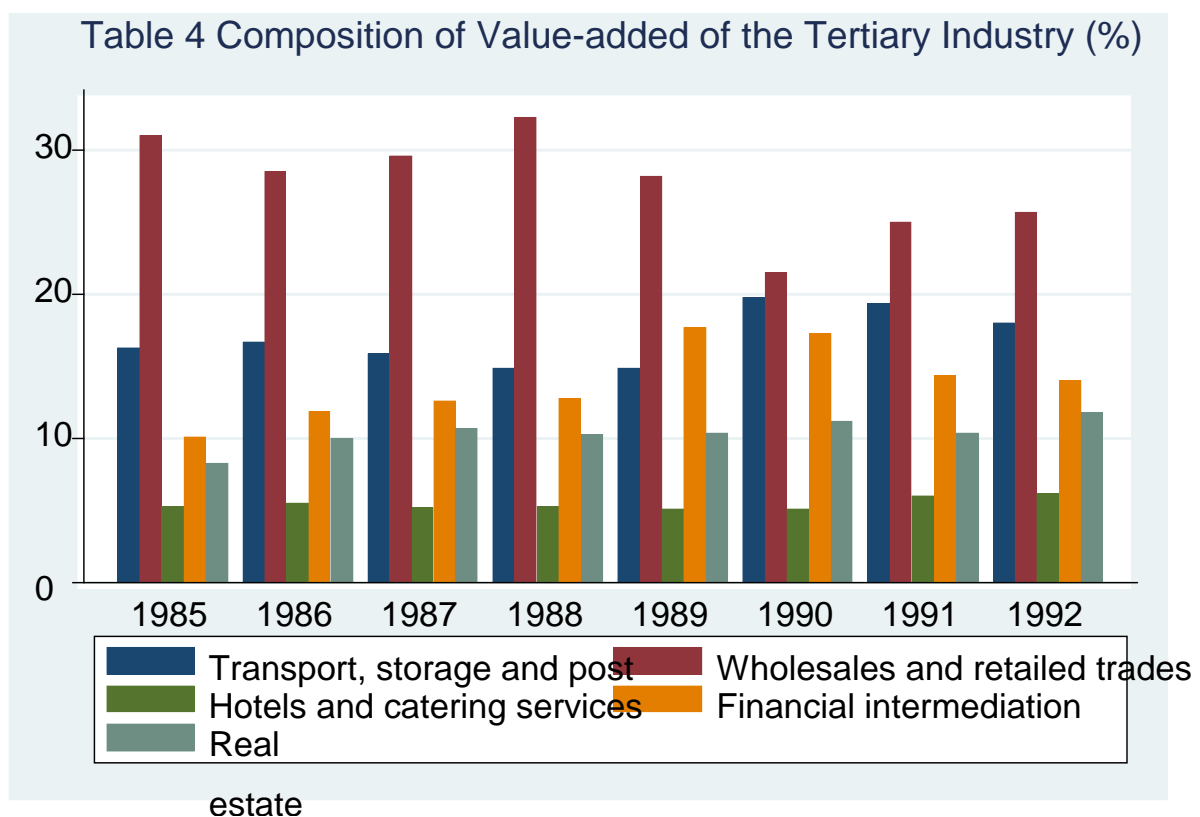
The government gave priority to transportation and communication. The transport structure was improved. The rational distribution of different mode of transport helped to improve its efficiency and quality. The focus points of communication were to increase the delivery value of traditional branch for fixing telephone and enhance the exploitation of modern communications technology such as communication and broadcast satellites.

The development of education and training started to get attention. Professional classes and hierarchy were under adjustment. Professional technical training was made chief component of modern educational system. All these provided tertiary industry with numerous high-quality specialized talents.

New industry was highly valued during this period. It developed vigorously and affected by world new technological revolution. In face of the coming of information age, new industries

such as information technology, advisory and advertisement would become mainstay industries in tertiary industry. Hence, the government made great efforts to develop these industries while improving the lagging situation of traditional tertiary industries.

At the end of this stage, the share of the tertiary industry in GDP increased from 28% to 34% and hit an all-time high. The average annual growth rate of value added was up to 20%. The quantity of employment was increased by 34 million. The total employment almost exceeded that of secondary industry until 1992. From table 4, the ratio of real estate and financial intermediation experienced a rapid increase of 3.5% and 3.9% respectively during these eight years although the share of wholesales and retailed trades decreased by 5.3%. All in all, large amount of labor force transferred into tertiary industry and it got a great development. However, this rapid growth was also with the characteristics of compensating under-development and adjusting property relation. (Data in this paragraph from the National Bureau of Statistics, 2007)



1.4 Third stage: 1993-2000

The dominant position of secondary industry was reestablished and strengthened in this stage. The notable feature of this period was that the ratio of secondary industry increased rapidly with the strengthening of the construction of infrastructures such as energy, transportation and communication (the State Development and Reform Commission, 2005).

Macro-control task that inhibited inflation and achieved overall balance was fulfilled basically after the previous economic reform. And the economic operation showed a good posture of high growth and low inflation.

However, structural contradiction in economic life especially the contradiction of industrial structure appeared relatively. First, the basis of agriculture was still weak and peasants' income increased very slowly. This was a fundamental structural contradiction in national economy. On the one hand, the situation of increasing output without increasing income was still widespread with the rising cost of production and low labor productivity. On the other hand, peasants' capacity to expand the purchasing power of consumer goods and capital goods was restricted by the low income. Second, the problem of the underdevelopment of infrastructure still existed. The infrastructure with regard to water supply, electricity supply, transport especially the urban and long-distance traffics and telecommunication were far from perfection. For example, the north and northwest areas suffered severe water shortage. The transformation task of power grid was on the agenda for the load increase and the popularity of electric appliances. Third, the quality and benefit level of the processing industry were quite low and market effective demand was insufficient. Fourth, the development of tertiary industry was comparatively lagging behind. China was one of the few countries with quite low proportion of tertiary industry and the ratio of value added of tertiary industry in GDP was only about 30% at that time (the State Development and Reform Commission, 2005).

The reasons for these problems were various. For one thing, the comparative shortages of resources like farmland and water and the serious surplus of labor force were the crux of contradiction of primary industry. For another, farmers' low income was the root cause of the contradiction between high ability of secondary industry to supply and insufficient demand.

The reform and opening-up of the late 1990s focused on closing unprofitable enterprises and dealing with insolvency in the banking system. The transition to a market based system in the early 1990s created two major problems. First the end of central planning required the creation of mechanisms to set monetary policy, and a system of banking and capital markets. Work was done throughout the 1990s to put these systems in place. Another problem involved that of state owned enterprises. Under a system of fixed prices, the inputs and output prices of SOE's were fixed, allowing them to use the difference to fund social services. Once input and output prices were market based, most of the SOE's then became extremely unprofitable, both because they were responsible for social service provision to their employees and because they were producing outputs that no one wanted to buy. This was temporarily resolved by borrowing from the banking system, but this created the problem of massive non-performing loans. In the late 1990s and early 2000s, this problem was dealt with by the closing of unprofitable state-owned factories and the development of social security systems. (Economic reform in the People's Republic of China, Wikipedia)

1.4.1 Changes in primary industry

The focal point of adjusting and upgrading China's industrial structure was issues concerning rural economy, agriculture and farmers. The basis of primary industry was weakest comparing to the other two industries. It was also most risky and lowest comparative advantage and should be regarded as the primacy of economic works. The fundamental solution to expand the market for industrial goods was to develop rural economy and increase the farmers' income. Moreover, the demand for the construction of infrastructure, public utilities, business, service trade, culture, health and sports would become the strong driving force of national economic development with the elimination of the gap between urban and rural areas. The development of these industries would also promote the improvement of technology thus produce more national wealth.

The adopted method of the adjustment of primary industry was to develop industrialized agriculture, which was to form the economic mechanism with the combination and mutual promotion of production, process and sales. The close combination of agriculture, processing and circulation would fundamentally change the disadvantage of agriculture. It helped to promote the process of commercialization, specialization and modernization of agriculture.

The government also made it a policy to develop the construction of small towns. It was the combining site of the economic structural adjustment of urban and rural areas. And its rapid development was a great help to the process of village urbanization.

The construction of agricultural infrastructure and environment were enhanced. The main methods were to speed up forestry planting, to conserve the water and soil of the middle and upper reaches of great rivers and to enhance the watershed management.

The greater and better yields should be developed actively on the basis of keeping steady increase of production.

At the end of this stage, the ratio of primary industry in GDP decreased by 4.6%, from 19.7% in 1993 to 15.1% in 2000. Its employment share was almost 50% which was still too high. (Data in this paragraph from the National Bureau of Statistics, 2007)

1.4.2 Construction of infrastructure

The government made policy to proceed with the construction of infrastructure of energy, transport and communication. The infrastructure construction of information was also given special attention from the beginning of 1990s. The development of these infrastructures was the main basis of the improvement of comprehensive national strength and an important mark of uptodateness.

The reasons that took the infrastructure construction as the driving force of economic growth were as follows. For one thing, it had a strong demand-oriented role in the development of manufacturing and construction industry. For another, its improvement was the essential condition of the development of a good many of industries. For example, the highway was the requirement of the development of motor manufacturing and so was the air bus to the transnational tourism. Even the high and new technology such as electric mechanism, new material and new energy could be used synthetically in this area.

The constructions of power facilities were to strengthen the improvement of power grids, to lower grid loss, to improve the security and economical efficiency of grid motion, to eliminate gradually the small generating sets of high energy consumption and pollution and to exploit the high-power generating sets.

The constructions of transport were to quicken the construction and transformation of existing railway, to construct a set of new ports and transform several old ports, to develop the river navigation and coastal and ocean trade and to open up new air routes. To enhance the construction of post and communication, new technologies such as satellites, optical cable and cell-type were adopted to construct a communication network that can connect home and abroad. From table 5, the infrastructure construction in transport and communication especially in civil aviation and cable lines got great increase.

As to the water conservancy construction, the government tried their best to enhance the comprehensive control of great rivers and lakes such as Huaihe River and Taihu Lake and to seize the Yellow River Xiaolangdi hydro-junction and the South-to-North water diversion project construction.

Table 5 The infrastructure construction of transport and communication (1000km)

Year	Length of railways	Length of highways	Length of navigable inland waterways	Length of civil aviation routes	Length of long distance optical cable lines
1993	58.6	1083.5	110.2	960.8	38.7
1994	59.0	1117.8	102.7	1045.6	73.3
1995	59.7	1157.0	110.6	1129.0	106.9
1996	64.9	1185.8	110.8	1166.5	130.2
1997	66.0	1226.4	109.8	1425.0	150.8
1998	66.4	1278.5	110.3	1505.8	194.1
1999	67.4	1351.7	116.5	1522.2	239.7
2000	68.7	1402.7	119.3	1502.9	286.6

Source: <China statistic yearbook (2007)>

The demands of electricity, haulage vehicle, building materials, steel, petrochemicals and construction business were induced by the development of the infrastructure construction of

energy, transport and communication. And this development reached its best level during the period of ninth five-year plan that was from 1995 to 2000. Moreover, this development and the resulting growth of manufacturing such as electrics, mechanism, petrochemicals and building materials were one of the chief growth poles of China's economy (Government work report of the State Council, 2001).

1.4.3 Changes in secondary industry

The economic growth in this period was obviously with the characteristic of taking secondary industry as the leading industry. The goods structure of foreign trade continued upgrading. That were changing from rough processing and low value-added products to deep processing and high value-added products. Hence, industrial departments such as electricity (basic energy industry), steel, machinery, motor, shipbuilding, chemical, electronics, building materials and so on became the main driving force of national economic development.

The immanent cause of this situation was that the prominent restriction of long-standing underdevelopment of energy, transport and communication industries. The improvement of these "bottleneck" industries after previous development correspondingly drove the growth of secondary industry (the State Development and Reform Commission, 2005).

The production capacity of the principal industrial products had already been very great. But generally speaking, a series of problems such as low technical merit, quality, scale merit, less competitive power and heavy pollution still existed. The root way out was carrying out technical reform, technological innovation and structural adjustment of business organizations to adjust and upgrade the product mix of industry segments.

The most impactive aspects to national economic development were as follows: to decrease the energy, raw materials and water consumption of products by the extensive use of new skills and crafts, to improve the quality of productions and decrease their costs to make them more competitive in the international market by means of applying new technology and expanding economics of scale, to exploit products with advanced international standards through technique acquisition and innovation.

With the improvement of the level of per capital income, residents' demand for durable consumer goods increased gradually. This demand drove the rapid growth of mechanical

and electronics industries. At the same time, the investment in infrastructure construction also drove the development of basic industry. The trend of heavy industrialization reoccurred.

As to energy industry, the guidelines of attaching equal importance to development and economy were carried out. For coal industry, the methods were to transform the old mines of eastern part and exploit the resources of middle and western parts. The guide-line for oil industry was to steady the eastern part and develop the western part while for raw materials industry was to improve the product quality and increase the varieties.

For the processing industry, the problems of high cost and less competitive power due to small scale, excessive consumption and large amount of employment were still very serious. And the direction of adjustment included the following aspects.

First, food, textile, light and pharmaceutical industry developed and produced marketable industrial consumer goods in view of the diversified consumer demand. The products should fit in with the different hierarchy of consumptions.

Second, the development of mainstay and market-oriented industries such as mechanical, electronics, petrochemical, and car-manufacturing industry mainly relied on the formation of economic scale and the improvement of economic benefit. The capacity of independent exploitation and innovation was strengthened at the meantime of the introduction of advanced technology.

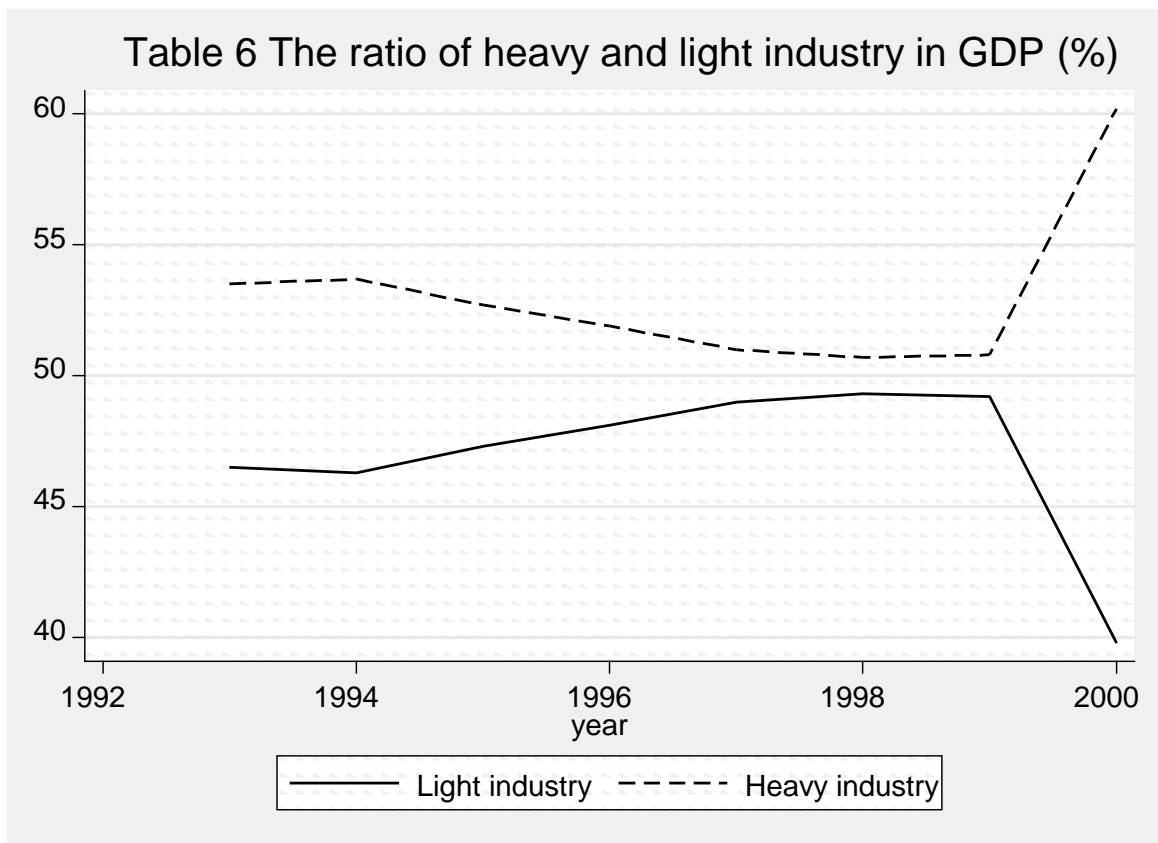
Third, the adaptation to the diversified international market promoted the capacity of the products of electronic, mechanical, light and textile industry to earn foreign exchange through export. The export strategy for light and textile products was to increase the export of high-tech and high-quality products and avoid the trade friction in single market. The electronics and mechanical products also took methods to expand the export of complete plants.

Fourth, the development of the products of heavy and chemical industry and light and raw materials industry made a great impression on the adjusting and upgrading of China's industrial structure. These products including large scale complete equipments, precision machinery, synthetic materials, organic chemical materials, pulp and so on were broad-

spectrum and in huge request. But the production capacity was insufficient. It was promising to change this situation by means of the rebuilding and extension of existing enterprises.

Fifth, the production capacity of raw materials industry such as cement, iron and steel was sufficient at that time. The key problem was that the variety structure was unreasonable. The guide-line for improving the product structure of raw materials was to focus on decreasing consumption, improving quality and increasing varieties.

Sixth, the high-tech industries should develop according to the need of market. The first imperative in this period was to develop a series of products that was urgently needed and within the production capacity in the areas of electronic information, new materials, bioengineering, new energy, environmental protection and aerospace.



At the end of this period, the ratio of secondary industry in GDP was 45.9% and the share of employment was 22.5% in the total employment (China statistic yearbook, 2007). From table 6, the ratio of heavy industry always kept downtrend until 1999. After that, its ratio increase sharply due to the development of deep processing and high value-added industry. The great growth of heavy industry in this stage changed the situation that its increase had been always

less than that of light industry since the beginning of 1980s. Although most products were oversupply and their production capacity could not be made full use, the level of per capita output was still very low. Another outstanding structural contradiction of the national economy was the imbalance of the current production capacity and the achievable effective demand. China's industrial products market had great potential in the long run. So the insistent task at that time was to make efforts to tap market potential.

1.4.4 Changes in tertiary industry

Tertiary industry was the main channel of employment and the new entrants to labor force was 6180 thousand persons in 2000. However, the ratio of value added of tertiary industry in GDP was only about 30% (China statistic yearbook, 2007). The increase of created value was not quick enough and the raised extent of ratio was not very big.

The underdevelopment of the infrastructure was one reason of the low proportion of tertiary industry. But the most fundamental reason was the inconsistency between the level of urbanization and economic development.

The development of tertiary industry was based on the growth of primary and secondary industry. These industries provided tertiary industry with funds and related industries and the improvement of their productivity could provided tertiary industry with more employment and resources. Rational arrangement and structure should be built. And its tasks differed between urban and rural areas.

In the urban areas, the development of business and catering service industry was preceeded. The entertainment and body-building industry that could employ the spare time such as tourism, culture and sports were emphasized. The information service industry that made good use of modern information technology was exploited effectively. The consulting service industry was divided into several segments that provided professional knowledge such as law, technique, financial affairs, investment and so on. Policies were also made to make sure the standard and sound development of finance, insurance and real estate industry.

In the rural areas, policies were made according to their local circumstances and combined with the industrialization of agriculture and the construction of small towns. Tertiary industry

that met the farmers' need such as commercial circulation, transport, catering service industry and so forth was put great emphasis on their sustained and rapid development.

At the end of this stage, the ratio of employment of tertiary industry in total employment was 27.5%. The ratio of it in GDP was up to 39% in 2000 and hit a record high ever since 1978 (China statistic yearbook, 2007).

1.4.5 Changes in regional economic structure

New change took place during this period. The Special Economic Zones were a good way to make full use of regional advantages but it also could bring regional development gap. The eastern and coastal areas proceeded with their development while the western areas kept the same pace with the countryside development. The speed of the development of central areas even exceeded the average growth speed of the whole nation (the State Development and Reform Commission, 2005).

The reason for this situation was that policies were made to promote the rational arrangement and coordinated development of regional economic structure. All regions took actions according to their local circumstances under nation-wide unified planning. The constructions of infrastructure and resources development in central and western areas were given top-priority. There was also policy support to these areas. This trend was going to continue and the regional structure would be improved gradually.

1.5 Fourth stage: 2001-2005

The tenth five-year plan was carried out in this period and it was the most important period for the strategic adjustment of economic structure.

Positive results were achieved after previous structural reforms. The situation of shortage of major agricultural products completely changed and the supply of them achieved total basic balance. The high-tech industries such as information industry grew rapidly. The elimination of backward industries and reduction to production capacity of excess industries got successful progresses. Tertiary industry continued to develop and its employment increased

gradually. Infrastructure construction got notable achievements and the limitation of “bottleneck” industries was relieved.

At the meantime, there were still some outstanding problems in economic structure. The main problem was the disproportionate size of secondary industry and tertiary industry. Slow achievement in upgrading the internal composition was also a problem found in all three industries. The imbalance of industrial structure led to a great deal of useless supplies and a large proportion of the commodities of low grade, low technological content and poor quality.

Under this circumstance, the structural adjustment was given top priority. It was the only way out for the economic growth. The adjustment of economic structure took the improvement of economic efficiency, overall quality of national economy, international competitiveness and the sustainable development as its goals. Moreover, the adjustment of industrial structure should combine with the adjustment of regional and urban-rural structures.

1.5.1 Changes in primary industry

The main guide-line was that the fundamental position of primary industry should be strengthened and the comprehensive development of rural economy should be promoted.

First, the stabilization of production capacity of grain was guaranteed. The main methods were to improve the irrigation and water conservancy facilities, the transformation of the low-yielding farmland and to adjust the contents and layout of the construction of grain production bases.

Second, the structure of primary industry and rural economy was rationalized. The adjustment was market-oriented and mainly relied on science and technology. Taking farmers and agricultural enterprises as main bodies increased the production in both breadth and depth.

The planting industry of high quality, yield and efficiency was developed by means of the adjustment of structures of the crop mix, variety and quality. The development of Xinjiang high-quality cotton base and the green food base of Yangtze River Basin was continued. The area of feed crops was expanded and the construction of pasture was strengthened. The

development of animal husbandry was accelerated through the improving of animal varieties. The ecological protection of fishery resources and fishing waste was enhanced and aquaculture and offshore fishing were developed actively.

The layout of agricultural production area was adjusted and the production pattern of large-scale and specialization was developed.

The coordination, services and policy support to the export of agricultural productions were strengthened and the agricultural sectors that could earn more foreign exchange were developed vigorously.

The introduction and development of the processing technology and equipments of agricultural products were speeded up. The industries such as marketing, storage, transport and preservation of products were developed. The level and efficiency of processing were improved.

The services for agricultural socialization were developed comprehensively by means of encouraging the innovation of agricultural services organization and cultivating brokers.

The constructions of system of agricultural quality standard, inspection and testing of products quality and market information were strengthened. The formulation and revision of agricultural industrial standards and quality standards of important products were speeded up. Standardized agricultural production bases were created under the guide of international standards.

The government also supported and guided the structural adjustment, technological progress and system innovation of township enterprises to achieve their rapid and healthy development.

Third, industrial management of agriculture was an important way to promote the process of agricultural modernization. The methods were as follows: to support the processing and marketing enterprises and scientific research units of agricultural products to guide farmers to enter the market, to provide the policies of fiscal, taxation and credit to support a series of leading enterprises to speed up their growth (Government Work Report of the State Council, 2006).

Fourth, China's accession to the WTO in 2001 brought great influence to the agricultural development. The tariff reduction increased the price competitiveness of the imported products. The prices got cheaper then decreased farmers' income. On the other hand, the elimination of trade barriers was in favor of exporting agricultural products. Hence, the market- and export- oriented agricultural products such as wheat, cotton, vegetables, high-quality fruits and flowers were large-scale cultivated. The accession also brought vast investment to develop rural economy and increase job opportunities.

1.5.2 Changes in secondary industry

The overall quality and international competitiveness of China's secondary industry, which was market-oriented and took enterprises as the main bodies, were improved by the technological development. Industrial reorganization and transformation must follow the rules of market economy that was, guiding the direction of investment correctly, relying on the existing foundation and preventing blind expansion of the scale and redundant construction (the State Development and Reform Commission, 2005). The combination of advanced technology and applicable technology relied on the combination of the introduction of new technology and its innovation. The transformation and upgrading of traditional industries were strengthened and the comparative advantages of labor-intensive industries got further development. And new comparative advantages were developed by the active growth of high-tech and new industries. The great development of social production capacity was gained by the stimulation of information to industrialization.

Moreover, the accession to the WTO brought challenges to China's secondary industry especially the mechanical industry. China's mechanical industry was low-scale-merit, low quality, poor level of technology and equipment and unperfect marketing and after-sale service system. The tariff reduction and the principles of non-discriminatory and fair trade were in favor of expanding export and attracting foreign investment and new technology. On the other hand, the tariff reduction and cancellation of non-tariff barriers impacted special mechanical products such as petrochemical industry severely. They also brought pressures of foreign competition. Hence, it was necessary to improve productivity, the technological level, the quality of the products and enhance the ability of substitutes for imported goods.

Firstly, the process of its transformation and reorganization and the upgrading of industrial structure were speeded up by means of increasing variety, improving products quality, saving energy, preventing pollution and raising labor productivity. The upgrading of products structure mainly relied on the improvement of the capacity of exploitation and further processing.

The products of raw materials industry such as plastics, synthetic rubber, synthetic, stainless steel, cold-rolled plates, alumina, highly efficient chemical fertilizers and pharmaceuticals were developed actively.

As to light and textile industry, the products of high market demand such as pulp, high-grade paper, paperboard, new household appliances, differentiated fibers, high-class fabrics, well-known brand clothing and processing agricultural products got positive development (the State Development and Reform Commission, 2005).

For the construction industry, methods were as follows: to improve the level of design, construction and supervision, to rectify and standardize the construction market, to ensure the quality of projects and to popularize the use of new building materials.

Secondly, the development of high-tech industries was promoted. These industries such as information technology, biological engineering and new materials were exploited on the basis of actual situation.

The development of manufacturing industry of information products was accelerated by the improvement of capacity of self-exploitation and system integration. Software industry also got positive development and the infrastructure construction of information industries was strengthened.

Digital and network technology were popularized in the aspects of technology exploitation of enterprises, marketing, public services and administration to achieve the combination of industrialization and information.

Thirdly, the organization structure of enterprises was upgraded. The pattern of moderate concentration within the industry, full competition among enterprises, taking large enterprises as dominants and coordinated development of medium and small enterprises was established by the guidance of the principle of specialized division of labor and cooperation

and market mechanism and macro-control (Government Work Report of the State Council, 2006).

Fourthly, the structural adjustment to the old industry bases was promoted. The upgrading of the industrial structure, the organization structure of enterprises and regional distribution took full use of their advantages of strong foundation and pooling talents. The alternative industries of cities and mining areas which mainly relied on resources exploitation were developed according to local conditions.

1.5.3 Changes in tertiary industry

The rapid growth of tertiary industry was an important way to promote the upgrading of structure and increase employment. The development of modern service industry such as information, finance, accounting, consulting and legal service promoted the overall level of service industry. The quality and efficiency of traditional service industries such as commerce, transportation and municipal service were transformed by the use of modern management methods and service technology. The content of service was increased. The industries that were highly needed by citizens such as real estate, community service, tourism, catering, entertainment and fitness were vigorously developed.

1.5.4 The infrastructure construction

First, water conservancy projects were strengthened. At the meantime of strengthening the flood control and disaster mitigation the problems of water shortage and pollution were also given prominent attention. The overall planning of national water conservancy and the watershed planning of large rivers were formulated and implemented scientifically.

Second, integrated transport system was established.

Third, the energy structure was upgraded by the full use of resource advantages, the improvement of implement efficiency and the strengthening of environmental protection.

1.5.5 Changes in regional structure

The coordinated development of regional economies mainly required the rapid growth of central and western regions and the implementation of the western development strategy.

First, the process of western development was vigorously promoted. The government provided preferential policy support in the aspects of export, taxation, land, resources and human resources to increase the financial transfer payments and investment for constructions.

The constructions of water conservancy, transport, communication, power grids and urban infrastructure were accelerated. A number of key projects of strategic significance such as the transportation of electricity and natural gas, water conservation and the exploitation of water resources were given top priority.

The ecological construction and environmental protection were strengthened. The development of animal husbandry, green food, tourism, medicinal herbs and bio-pharmaceuticals was promoted (Government Work Report of the State Council, 2006). The conversion from resource advantage to economic advantage was accelerated.

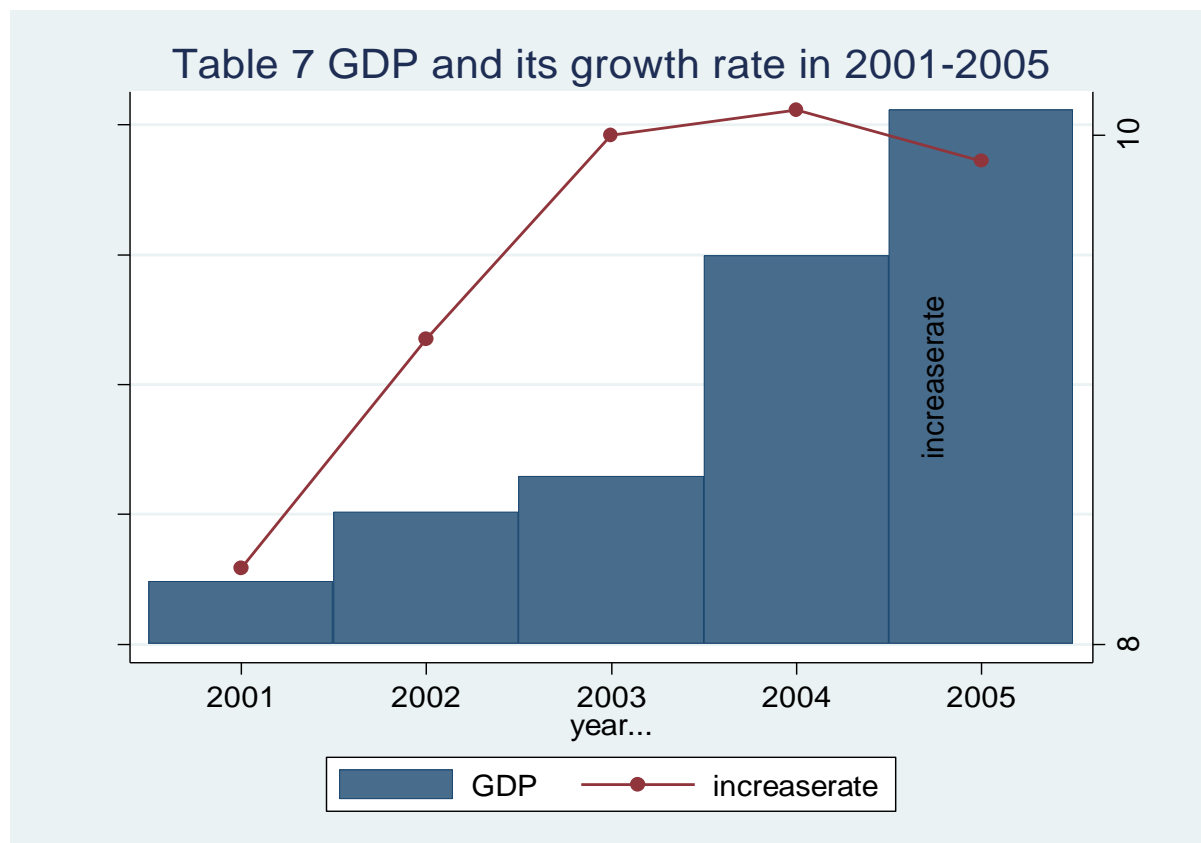
Compulsory education and vocational training were developed and the use of high and advanced applicable technologies was popularized.

Second, the development of central areas was not neglected. Their geographic and comprehensive resources advantages were made full use.

The dominant position of agriculture was consolidated. Regional, professional and large-scale agricultural bases of production, circulation and processing were developed there.

Traditional industries were transformed and competitive manufacturing industries were developed.

Third, the level of development of eastern areas was promoted. High and new-tech industries, modern service industry and export industries were given priority to develop in the process of structural upgrading. The eastern regions strengthened the economic and technologic cooperation with the central and western regions.



As can be seen in table 7, GDP in 2005 was 18232.1 billion RMB that almost doubled that in 2001 and the annual growth rate of GDP was up to 9.5%. The ratio of three industries in GDP in 2005 was 12.5%, 47.5% and 40.0% respectively comparing to that of 14.4%, 45.1% and 40.5% in 2001. The secondary industry got rapid growth again but the tertiary industry did not get enough development. Social investment in fixed assets was up to 8860.4 billion RMB. The increase rate of investment of eastern, central and western regions was 24%, 32.7% and 30.6% respectively. They showed the fund support to the central and western areas.(Data in this paragraph from the National Bureau of Statistics, 2007)

1.6 Fifth stage: since 2006

The eleventh five-year plan was carried out during this period and it was the most critical period to comprehensively build a well-off society (The Outline for the Eleventh Five-Year Plan, 2006). China faced not only rare opportunities but also serious challenges.

Great progresses were achieved after the implementation of tenth five-year plan. Comprehensive agricultural production capacity was strengthened. Stable increase of grain

output and farmers' income laid foundation for the stable and rapid development of economy and society. Development planning and industrial policies of energy, important raw materials and equipment manufacturing industries were formulated and implemented. Backward production capacities which were of high energy consumption and high pollution were eliminated.

At the meantime, many difficulties and problems still existed in the economic and social life. Some long-term accumulated and deep-seated contradictions were not fundamentally solved. There were also a number of new issues that could not be ignored. The resources such as farmland, freshwater, energy and important mineral resources were not enough relatively. The ecological environment was weak and the economic structure was irrational. Some industries were of over production capacity due to blind expansion. The transformation of economic growth mode was too slow. The consumption of energy and resources was excessive and the environmental pollution became worse.

1.6.1 Building a new socialist countryside

The main policies here were to take the development of comprehensive agricultural production capacity as the primary task, to change the growth mode and to strengthen its fundamental position.

First, industrial structure of primary industry was upgraded. The proportion of aquaculture industry was increased at the meantime of the stable growth of the output of grain, cotton and oil. The development of animal husbandry and dairy industry was accelerated and their scale, intensive and standardized level were improved. Economic forest and flower industry developed on the basis of local situations. The intensity of fishing was strictly controlled.

Second, the products structure of primary industry was upgraded. The direction of the development of agricultural products were high-yield, high-quality, efficient, ecology and safe. Those were high-quality grain varieties, aquatic products, high-efficiency economic crops and livestock products.

Third, the regional pattern of primary industry was upgraded. The comprehensive capacity of grain production of Huanghuaihai plain, middle and lower reaches of the Yangtze River and

northeast plains was improved. Industrial zones of economic crops were built in the regions of suitable climate. Water-saving agriculture was developed in dry areas.

1.6.2 Promoting the optimization and upgrading of industrial structure

The main requirements of new-style industrialization were to adjust the production structure, the organizational structure of enterprises and industrial layout so that the overall technical level and competitiveness could be improved (the State Development and Reform Commission, 2005).

First, the development of high-tech industries was speeded up. The focus of high-tech industries was changing from processing and assembly to independent research and development according to the requirement of industrial concentration, scale development and the expansion of international cooperation. A number of leading industries with core competitiveness and multinational high-tech enterprises were guided to establish. The development of these industries especially the manufacturing industry of electronic information, bioindustry, aerospace industry and new materials industry was speeded up.

Second, the equipment manufacturing industry was revitalized. The manufacturing and development of major technological equipments such as UHV equipment, large metallurgical equipment and CNC machine tools were strengthened. The level of automotive and shipbuilding industry was also improved.

Third, the optimization of energy industry got top priority to conservation. Moreover, the coordination of production and consumption structure was a help to build a stable, economic, clean and safe energy supply system. The exploration of coal was the basis of energy industry. The main tasks of electricity industry were the construction of large efficient environmental protection units, power grids and nuclear power plants (State Work Report, 2008). The network of oil and natural gas pipelines were improved gradually. The use of renewable energy was popularized vigorously.

Fourth, the structure and pattern of raw materials industry were adjusted especially the layout of metallurgical and chemical industries. The construction and building materials industries

upgraded their industrial structure under the principles of the conservation of energy and resources, the protection of ecological environment and improvement of products quality.

Fifth, the process of information industry was promoted. The transformation of manufacturing industry relied on information. The information resources were exploited. The infrastructure construction such as broadband communications network and digital TV network was improved. Information security was also strengthened.

1.6.3 Rapid growth of tertiary industry

For one thing, the service industry majorly facing producers got vigorous development. The main tasks were to deepen the specialization, reduce the social transaction costs and improve the efficiency of resource allocation. The transportation was given top priority to develop. The growth of modern logistics industry, financial service industry, information service industry and business service industry was also accelerated and standardized.

For another, the service industry mainly facing consumers continued to develop under the adaption to the upgrading trend of consumption structure. The development of these industries such as trade service, real estate, tourism, municipal utility services, community service and sports industry was also promoted (Government Work Report of the State Council, 2008). Diversified demand was going to be satisfied by the expansion of supply of inadequate service products.

1.6.4 Promoting the coordinated regional development

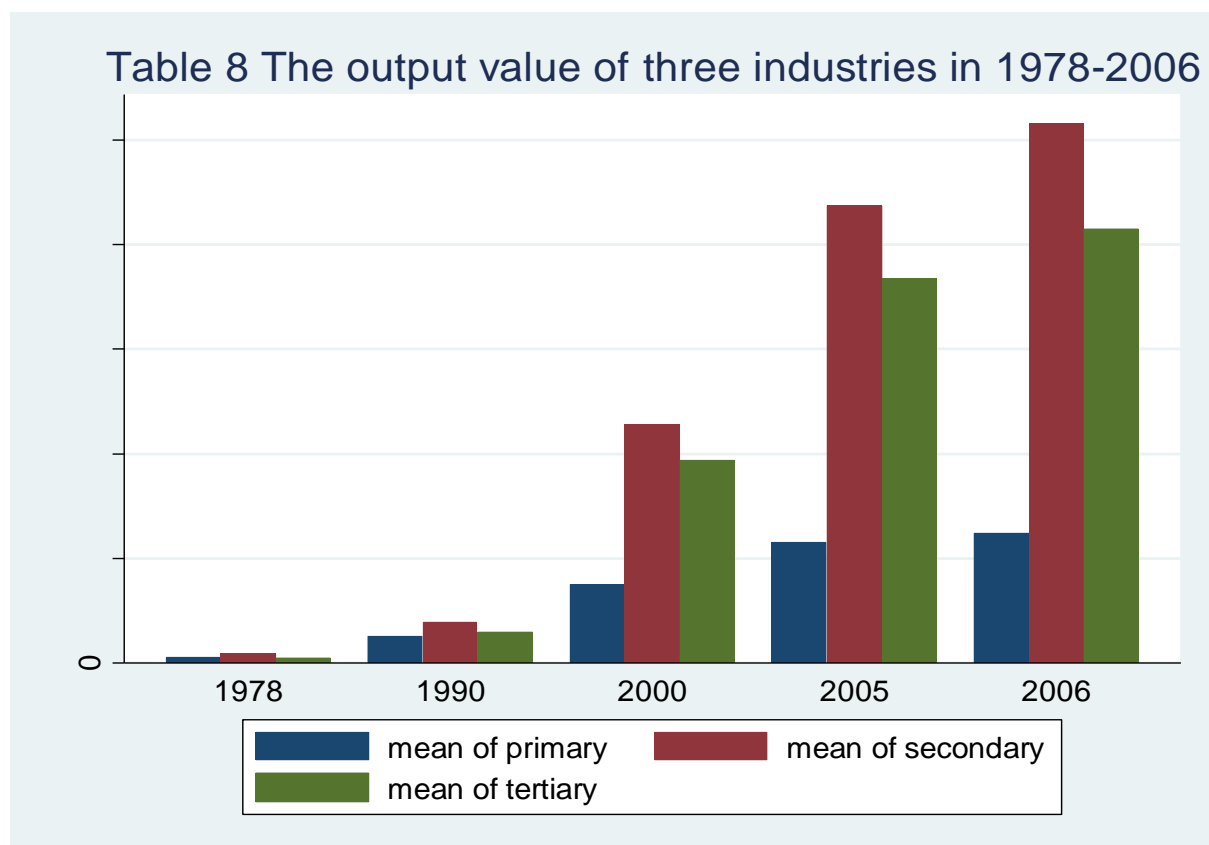
The overall regional development strategy was to adhere to the implementation of western development strategy, to revitalize the northeast and other old industrial bases, to promote the growth of central region and to provide policy support to ethnic regions and border areas. The regional interaction and coordination mechanism were improved to create a rational regional development pattern.

1.6.5 Reduction of energy consumption

The policy orientation of energy conservation and efficient utilization was strengthened. Structural energy saving could achieve by optimizing the industrial structure especially reducing the proportion of high-energy-consuming industries. Technological energy saving could achieve by popularizing energy-saving technologies.

China's GDP in 2007 was up to 24660 billion RMB and its annual increase rate was 10.6%. The proportion of three industries in GDP in 2006 was 11.7%, 48.9% and 39.4% relatively. (China statistic yearbook, 2007)

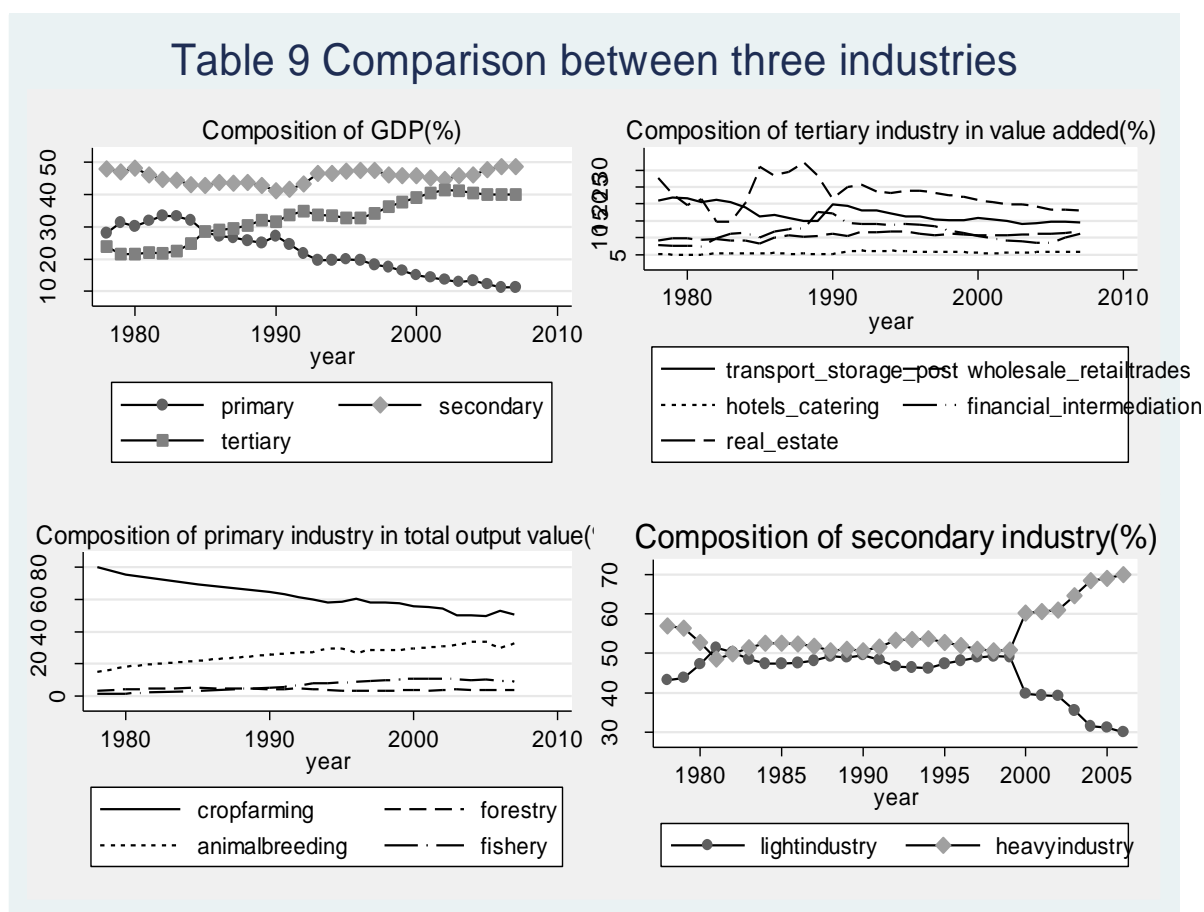
1.7 Summary



As can be seen from table 8, the total output value got an outstanding growth comparing 1978 with 2006. Among three industries, the increase of primary industry was the least. The growth of secondary industry was the biggest. The output value of secondary industry in

2006 was about 59 times more than that in 1978. The development of tertiary industry was not so sharp but still more than the primary industry.

Table 9 Comparison between three industries



From table 9, the composition of three industries was improved obviously and the industrial structure changed rationally. The ratio of primary industry in GDP increased until the mid 1980s and then kept a persistent downtrend. The ratio of secondary industry changed continuously but always kept between 40% and 50% that always occupied the leading position. The ratio of tertiary industry kept the ascending trend before 2002 then decreased slowly.

The overall tendency of internal primary industry was that the ratio of planting industry decreased, the ratio of forestry relatively stabled and the ratio of husbandry and fishery increased. The changes of the internal structure of primary industry were more obvious before 1990. After that the trend of changes smoothed down.

Heavy industry declined quickly from 1978 to the mid 1980s then kept relative stabilization. There was a growth in heavy industry from 1992 because of the development of

manufactural industry and infrastructure construction. From 1999, the heavy industry kept a rapid ascending trend and the industrial growth showed the heavy-industry-oriented pattern. The industrial structure started to change from labor and capital intensive industry to skill intensive industry.

At the beginning of the reform and opening-up, the tertiary industry was mainly relied on the traditional industry such as commerce, catering trade, neighbourhood services, transport and postal service. After 20 years' development, the emerging industries such as information, insurance and real estate also developed quickly. The biggest ratio of tertiary industry was wholesale and retail trades.

2. A structural comparison between China and India

China and India are neighbors and have many similarities in the aspect of national basic conditions. They both have a large population, a weak economic background. They are almost at the same starting line in the process of industrialization and social and economic modernization. But the effects are a bit different, which also result in different industrial structures and economic patterns.

2.1 The common features of economic development

China and India adopted similar economic development strategy in the days of their national independence. As can be seen from table 10, the similarities of these two countries at the starting point are as follows:

Table 10 The economic conditions of China and India in 1952

	China	India
GNP(million US dollar)	30000	22000
GNP per capita(US dollar)	52	60
Coal per capita(kilo)	96	97
Rice yield(ton/hectare)	2.5	1.3

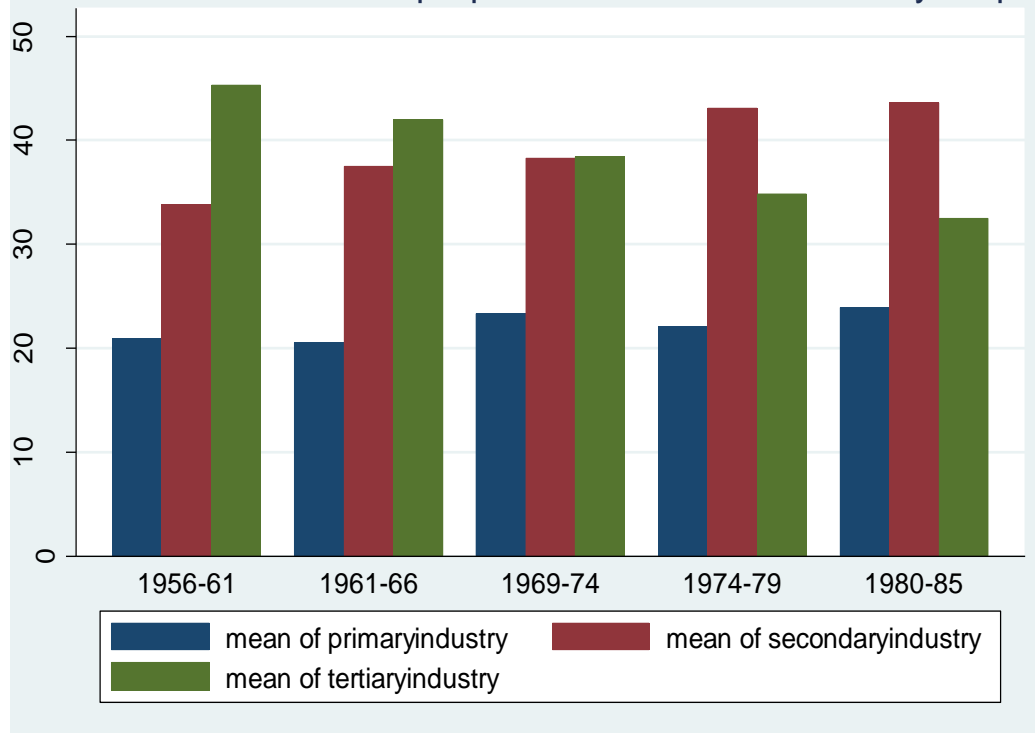
Data: < China: socialist economy development >, 1983

In the aspect of industrial transformation, they both gave priority to heavy industry in the initial stage of economic reform. China started to carry out such strategy ever since 1950s under the impact of Soviet Union. China's total output value of heavy industry occupied a proportion of 35.5% in total industrial output value in 1952. And this proportion increased to 56.9% by 1978 (China statistic yearbook, 2007). India emphasized the importance of developing heavy industry and basic industry ever since the second five-year plan (1956-1961). The ratio of investment in heavy industry was up to 84% in the total intended

investment in secondary industry during this period (Chen JiDong & Chen JiaZe, 2005). Indian government adjusted the original industrial structure directly through the change of investment proportion in different industries.

As can be seen from the table 11, in the period of speeding up the establishment of industrial system, there was an obvious investment support to secondary industry. This investment support was the need of implementing the strategy of prioritizing heavy industry. Hence, the main reason for the rapid growth of India's secondary industry especially heavy industry was the long-term high investment rate.

Table 11 India's investment proportions in successive five-year plans(%)



The strategy of prioritizing heavy industry was at the cost of distorting the factor prices and economic efficiency of the whole society. Industry discrimination and price scissors arising therefore led to the long-term slow growth and even standstill of agricultural development. The price scissors was an economic phenomenon that the price of agricultural product was always lower than its value while the price of industrial product was always higher than its value in the long-term exchange between them (Ba ZhiPeng, 2004). It could transfer fund from agriculture to industry automatically then promote the process of industrialization in the

short run. However, the over extraction of agricultural surplus would inevitably lead to negative impact to the whole economy in the long term.

2.2 Different path of India's structural transformation

Although the basic conditions of China and India are quite similar and also have many common characteristics in economic reform, their industrial structures vary greatly.

2.2.1 India's industrial model

China follows the traditional path of industrialization that is following the procedure of primary-secondary-tertiary and takes secondary industry especially manufacturing industry as the core of economic development at the present stage.

As for India, it's said it may be the only country that "bypasses the stage of industrialization but goes directly into the stage of post-industrialization" (Li Ke, 2007). The value added of primary, secondary and tertiary industry in China occupied the proportion of 15%, 51% and 34% in GDP in 2002, while that of India were 23%, 27% and 51% (Zhao Jianjun, 2006). China's secondary industry occupied more than half of the composition of industry and India's economic growth was mainly driven by tertiary industry.

India's economic growth pattern is quite different from other countries in Asia especially China. It mainly relies on domestic market instead of export, on consumption instead of investment, on tertiary industry instead of secondary industry, on high technology instead of low-skilled manufacturing.

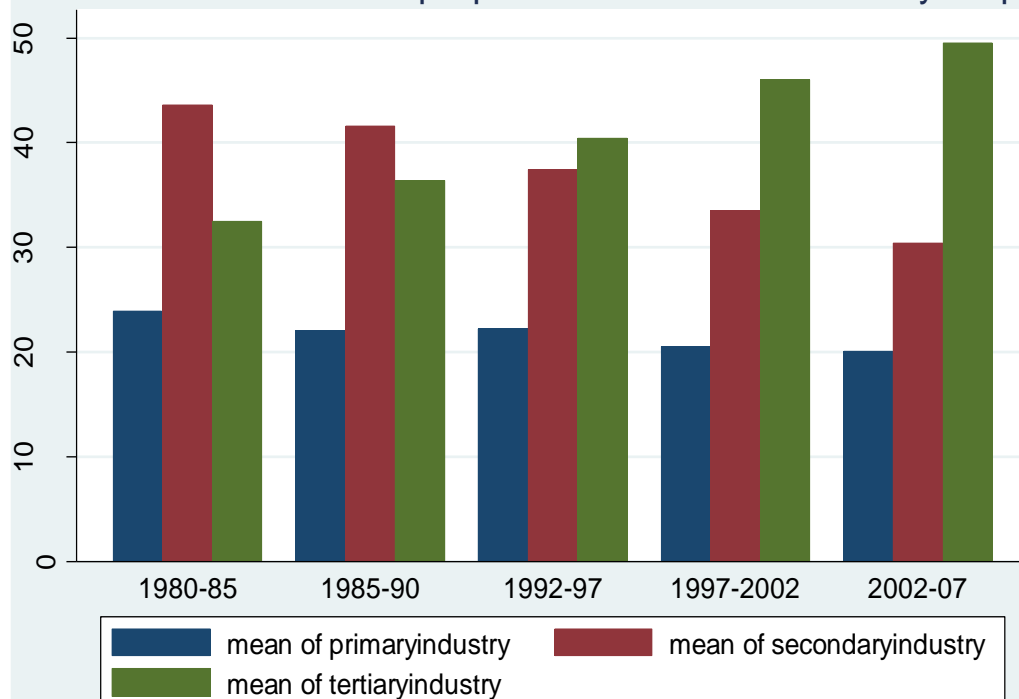
Indian industrial model also has the characteristic of "two high and one low" that is the coexisting of high proportion of agricultural population, highly-developed IT industry and underdeveloped manufacturing industry. The proportion of agricultural population in total population was up to 70% in 2006. The composition of three industries in GDP was 24%, 25% and 51% respectively in 2004 (Zhu XiaoGang, 2006). Hence, the highly-developed skill- and capital-intensive service industry and seriously insufficient development of manufacturing were the main features of Indian industry.

2.2.2 India's service industry

India's service industry plays a very important role in Indian economic growth. The high growth of Indian economy during these 20 years (India started the economic reform in 1980) to a large extent should be attributed to the rapid development of service industry. The annual growth rate of tertiary industry was 7.8% since 1990s, which was obviously higher than 4.5% of agriculture and 6.4% of secondary industry at the meantime. It undoubtedly becomes the major driving force of economic growth.

The reasons for the formation of this pattern are various. First, India has a large population. There are great demand for services and strong supply capacity. Second, India's national capital was inadequate and could not attract enough foreign investment. Third, India did not implement the reform and opening-up policy until 1991 when new technology revolution just started. Forth, the long-term implementation of the elite education brings India with a large number of IT professionals. Fifth, the underdevelopment of infrastructure prevents the development of secondary industry.

Table 12 India's investment proportions in successive five-year plans(%)



As can be seen from table 12, the ratio of investment in tertiary industry increased gradually after the basic formation of industrial system. The rapid growth of tertiary industry could not be separated from the government's fund support.

Indian government started to pay attention to technology and service export since 1980s. In the mid-1980s, Rajah Gandhi government provided policies support such as tax incentives and tariff concessions to vigorously develop high and new technology, especially computer technology. "Export of computer software, software development and training policy" was also introduced during this period (Jiang Yong & Wang Lei, 2005). All of these became the important turning point of the development of software industry.

Rao government started to carry out the plan of building software technology parks in 1991 and 13 state-level software technology parks were setting up nationwide gradually. More preferential policies and good facilities and services there did great help to open up international market. These parks became major bases of developing and exporting of software industry since then.

India formulated the action projects of Indian information technology to comprehensively promote Indian information industry in 1998. The main measures included lifting tariffs and income tax of IT products, allowing and encouraging all kinds of information application and information services and allowing information users in remote areas to use backbones of defense communications system (Du Tao & Qi Huan, 2002).

Indian government established the ministry of software industry in 1999. Its policy support and investment became more extensively. Every state also begun to set up "Indian institute of information technology" on the basis of 6 nation-level "Indian institute of technology". Private and foreign educations were strongly encouraged.

The rapid development of India's information technology industry especially the software industry was the most outstanding success of the industrial transformation and the strongest driving force of economic growth. The total output value of software industry was more than 4 billion US dollars in 1999 and this value increased to 7.68 billion US dollars in 2001. The annual output value of information technology and related service industries was 28 billion US dollars in 2004-2005 and the proportion of software and information services in it was 58.6%. Employment in related industries in the same period reached 1.04 million (Du Tao &

Qi Huan, 2002). India has been second only to U.S.A. in the global software market and the software industry has been one of the pillar industries of India's high-tech products export.

Along with the rapid growth of information industry, the resulting service outsourcing industry also developed quickly. Indian government extended the preferential policies of software industry such as tax exemption to other information related service industries. These outsourcing businesses included data processing, geographic information system services, human resources management, accounting services, engineering design and so on. India occupied 65% of world offshore information service and 46% of world outsourcing industry by the end of 2006 (Zhu XiaoGang, 2006).

Although software industry increased very fast, its output value only occupies 10% of the total output value of the whole service industry. The biggest industry group was still the wholesale and retail trade, daily necessities repairing and hotels catering industry. Generally speaking, India's private corporations controlled most of the wholesale, retail and distribution while government controls the financial services system.

Table 13 Growth rate and the composition of Indian service industry (%)

Year	Average growth rate			Internal composition of tertiary sectors			
	1980-89	1990-99	2000-05	1980	1990	2000	2005
Wholesale and retail	5.9	7.3	12.5	31.5	29.3	28.4	27.5
Hotel and catering	6.5	9.3	13.3	1.9	1.7	2.1	2.8
Communication	6.1	13.6	12.1	2.7	2.5	4.1	3.4
Banking	11.9	12.7	9.1	5.1	8.4	13.1	10.9
Insurance	10.9	6.7		1.3	2	1.5	
Real estate	7.7	5.0	13.8	10.8	11.8	9.3	15.9
Business services	13.5	19.8		0.5	0.7	2.3	

Legal services	8.6	5.8		0	0	0	
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Data: <A Comparative Analysis of Development of Service Industry between China and India>, Wei Zuolei

From table 13, hotel and catering, communication, banking and business services industry grew faster than the others. The proportions of wholesale and retail, banking and real estate were bigger than others. The sum of these three was more than half of the whole service industry in 2000. Traditional wholesale and retail industry still occupied the main part of service industry. But the development of Indian business services including IT industry was very striking. The average growth rate was 19.8% in 1990s, which was far higher than the average growth rate of GDP in the corresponding period. Indian banking industry also increased quickly. Banking and business services all were skill-intensive service industry. The rapid growth of these two industries showed there was an enormous impetus of technology to Indian service industry, which was mainly attributed to the phenomenal progress of information technology.

2.2.3 India's primary industry

Indian primary industry plays a comparatively important role in national economic growth. From table 14, the employment of India's primary industry still occupied more than half employment of the whole society. The growth rate of agriculture to a large extent determined the growth rate of the entire national economy, which was a notable feature of Indian economic development.

Table 14 India's employment structure (%)

Year	1983-1984	1987-1988	1993-1994	1999-2000	2001-2002
Primary	63.2	60.1	60.4	56.7	56.0
Secondary	15.6	17.6	15.8	17.6	18.1
Tertiary	21.2	22.3	23.8	25.7	25.9

Data: <A Comparative Analysis of Development of Service Industry between China and India>, Wei Zuolei

Indian government started to carry out Green Revolution that depended on agricultural technology changes to induce the development of agricultural production in 1966. This Green Revolution eased the long-term tension of food shortage and accelerated the commercialization of agricultural products.

Government laid great attention on the diversification of agricultural products and improved the agricultural structure to meet the diverse needs of the market ever since 1980s. It lifted restrictions on trade in agricultural products and expand the export of high-quality rice, cotton and jute.

Indian government started to set up Agri Export Zones in 2001. These zones were more than 60 and covered more than 20 states in the whole nation by the end of 2006.

All these methods became a great driving force to the development of primary industry. The level modernization of agricultural production was promoted to some extent and food production increased substantially. However, there were also some serious adverse factors. Inadequate construction of modern infrastructures seriously restricted the development of agriculture. A large number of poor people and unemployment blocked the increase of farmer's income. The income gap between south and north, rural and urban was also a big constraint. The agricultural reform was incompletely. The reform neither led to the transferring of agricultural labor force to other departments, nor the significant change of internal structure of agricultural production. Due to this characteristic, the development of primary was very slow, the productivity level was not too high and the agricultural structure could not get improvement for quite a long time.

2.2.4 India's secondary industry

India strongly developed the heavy industry since the mid-1950s. The increase in demand for capital goods promoted the development of machinery manufacturing industry. Indian government continued to increase capital accumulation rate and try to attract foreign investment to increase the capital supply. A large number of foreign advanced technology and equipments were introduced and more and more scientific and technological achievements were transformed to new production productivities. Rao government allowed private and foreign businesses to engage in all departments of secondary industry except

national defense, security, railway, nuclear energy, minerals and pollution-carrying industries and release the control over monopoly enterprises (Jiang Yong & Wang Lei, 2005).

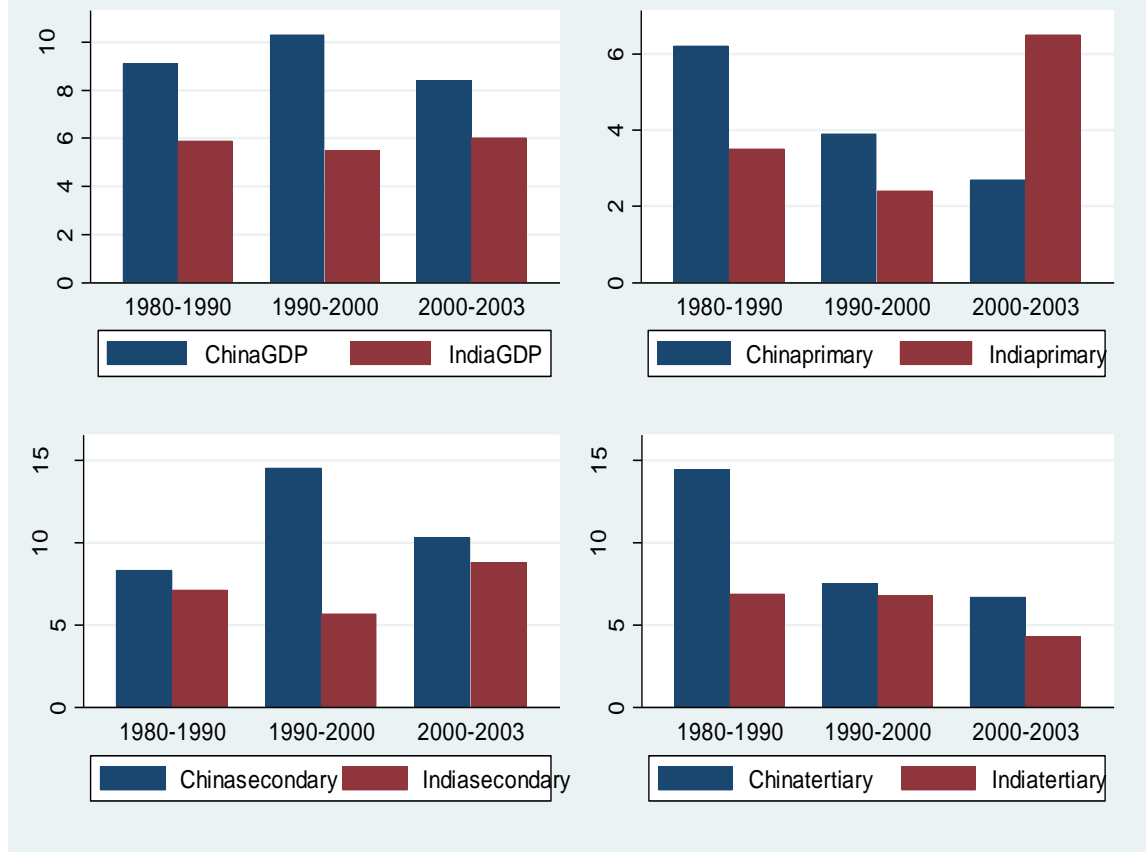
Indian government made effort to develop secondary industry and the modern industrialization was established basically. Due to lagging infrastructures, although newly developing industries such as automobile, pharmaceutical, steel, shipbuilding, textiles, diesel engines and bicycles begun to take shape, their products of poor quality lacked competitiveness in the international market.

From table 14, the employment of secondary industry only increased by 2.5%, from 15.6% in 1983-1984 to 18.1% in 2000-2001. It showed that secondary industry could not absorb large numbers of rural surplus-labor and its development did not have the characteristic of expansion.

The position of secondary industry in Indian economy was promoted gradually but the share was not too high. Its share in GDP increased from 14.59% in 1950-1951 to 28.81% in 2000-2001. This situation to a certain extent showed that India's secondary industry was still relatively backward.

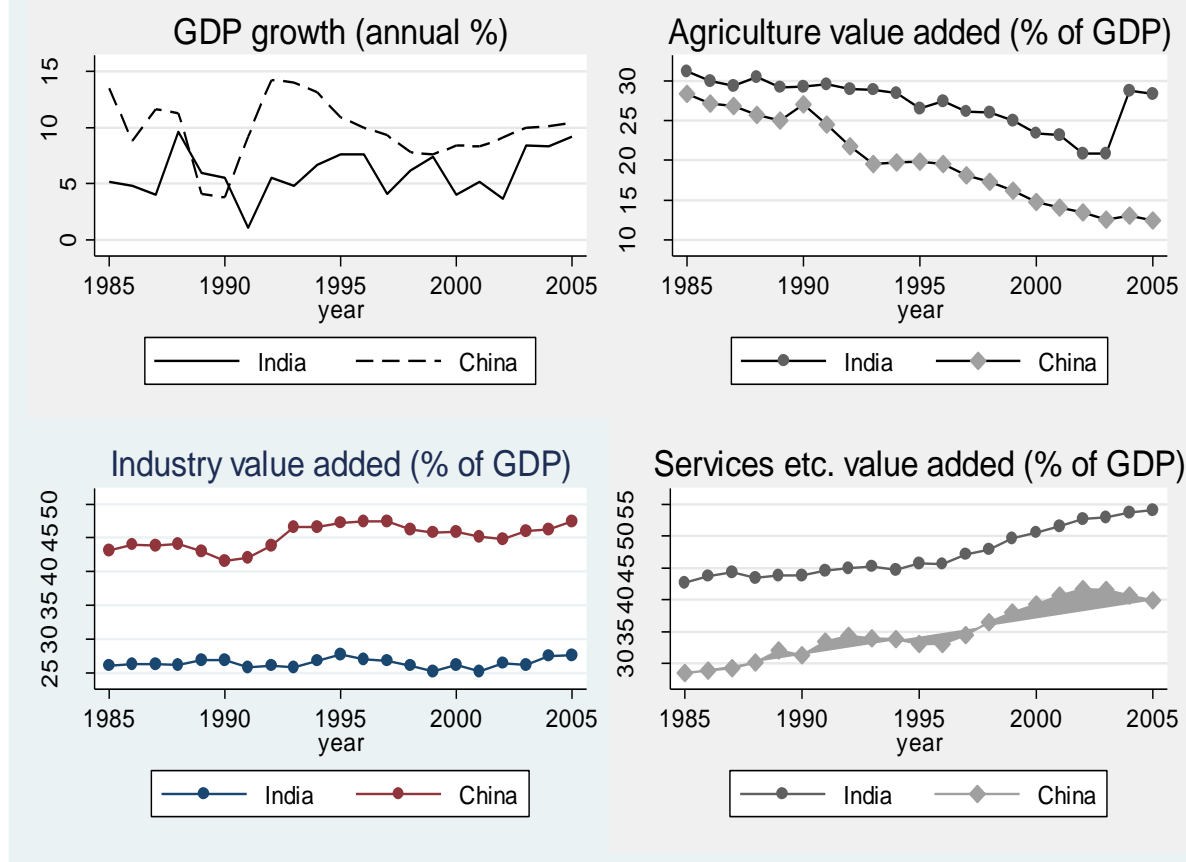
2.3 Comparison between China and India

Table 15 Comparison of growth rate between China and India (%)



From table 15, the average growth rate of China's GDP is always higher than India's GDP from 1980 to 2003 and almost twice over in 1990s. China's primary industry increased rapidly during the first stage of industrial adjustment then this pace slowed down gradually. India's primary industry didn't get fast development until the beginning of 21 century. The growth rate of China's secondary industry continuously kept a rather high level, especially in 1990s. India's secondary industry decreased slowly and started to increase recently. The average growth rate of China's secondary industry between 1980 and 2003 was almost twice as much as that of India's. China's tertiary industry grew a lot in 1980s and decreased rapidly later. The grow rate of china's secondary industry was almost twice over that of tertiary industry after 1990. India's tertiary industry almost kept the same pace with secondary industry during the corresponding period.

Table 16 Comparison of industrial composition



From table 16, China's annual growth rate of GDP was almost always higher than India. Their composition of value added in GDP shows distinctly their own industrial structure. In the respect of agriculture, the value of India was always higher than that of China. The gap between these two expanded gradually after 1990 and reached a climax in 2004. In a modern industrialized economic society, the situation that primary industry occupied a large proportion in GDP growth itself indicated backwardness. As for secondary industry, the gap between these two sets of data was striking. The share of value added of China's industry was almost 50%, which was twice over that of India's. In view of service industry, the contrary was exactly the case. These graphs present clearly that China's economic growth mainly relied on the development of secondary industry while India's service industry was the major driving force of the economic growth.

2.3.1 Differences in trade structure

In the aspect of trade method, the main method of China is processing trade while the main method of India is general trade.

In the aspect of trade composition, the share of service trade of India is higher than China. China is the net importer of service trade while India's import and export of service trade is in the balance basically.

India's industrial structure is helpful to promote the expansion of services export. With the progressive development of the service industry, India's foreign service trade is also growing. Taking information technology service for example, the annual growth rate of software and related service industries was 46% since the mid-1990s. The export amount of software service was less than 100 million US dollars in the early 1990s while it increased to 12.5 billion US dollars in 2004 (Wen Fude, 2005). India's IT outsourcing industry also started to develop recently. India now becomes the second largest software exporter and first largest country that providing software outsourcing services. More and more foreign service work transferred to India. Cheap brainpower enables India's service industry to become the most competitive industry in the world.

2.3.2 Differences in infrastructure construction

The level of infrastructure construction of China is higher than that of India. It has higher levels of electricity, transportation and communications infrastructure. By 2001, the capacity of generator installation had reached 338 million kilowatts, ranking second in the world. The revenue kilometers of railway had been more than 70,000 km, ranking third in the world. Highway mileage had increased 1.7 million kilometers, ranking fourth in the world.

The condition of India is really lagging. Although the total length of railway is no.2 in the world, its uptodateness lags far behind. The condition for highway is really poor and severe damaged.

2.3.3 Differences in overall economic structure

The main impetus of India's economic development is service industry especially information technology and software industry, which are in the leading position in the international market. The economic natures of service industry to a certain extent determine the advantages of such industrial structure. The industrial sequence is tertiary-primary-secondary.

The employment structures of these two countries in 1980 were quite similar. The ratios of employment in those of China and India were 74%, 14%, 12% and 70%, 13%, 17% respectively. However, the composition of GDP was quite different. They were 30%, 49%, 21% and 38%, 26%, 36% respectively (Chen JiDong & Chen JiaZe, 2005). China's primary industry occupied 4% more employment than India's but the output composition was 8% less. For secondary industry, China's employment was 1% more and the output composition was 23% more than that of India. As to tertiary industry, China's employment was 5% less and the output ratio was 15% less. On the face of it, India's primary and tertiary industry were more developed and China's secondary industry grew more quickly.

Such kind of industrial structure can reduce the demand for resources and the environmental pollution. India has a vast territory and rich natural resources, but some important resources such as oil are inadequate. Comparing with secondary industry of which main part is manufacturing industry, service industry obviously has relatively small demand for natural resources especially energy. The vigorous development of service industry can to some extent reduce the demand of economic growth for natural resources. Along with the increase of modern industry factories and urban population, industrial and domestic wastes also increase accordingly. Therefore, the rapid growth of service industry to a certain extent reduces the environmental pollution. In other words, it protects the ecological environment needed by economic growth.

On the other hand, its capacity of absorbing labor force is limited. Knowledge-intensive service industry mainly needs elite talents rather than common populace with low level of education. A large number of rural surplus labor forces with low level of education and labor skills can not be absorbed since the underdevelopment of manufacturing industry. Although

service industry grows so rapidly, job opportunity brought by service enterprises is far beyond enough comparing with the employment demand.

For China, the dominant industry is secondary industry. The primary industry is fundamental but weak. The development of tertiary industry seriously lags behind India. Moreover, China's economic growth is mainly driven by high input, high energy consumption and high pollution. This extensive growth that only focus on the increase of GDP rather than the quality and efficiency of the growth is not conducive to improving China's international competitiveness and not sustainable.

China's leading industry was secondary industry especially heavy industry. The growth rate of the heavy industry increased rapidly since 1999. The ratio of secondary industry in GDP also increased greatly during the tenth five-year plan and kept an irrational ascending trend. Moreover, the ratio of tertiary industry declined irrationally. It was mainly due to China's GDP-oriented economic growth pattern that local government only focused on the secondary industry which brought short-term rapid increase in total GDP but ignored the importance of rational industrial structure (Blue Book of Development and Reform, 2008). For another, such kind of industrial development pattern consumed huge plenty of energy and resulted in serious pollution. Those heavy industries relied on non-renewable resources such as iron, steel and coal were unsustainable.

India's economy mainly relied on tertiary industry especially information and software industry. These industries could not absorb too much labour and ask for relatively high level of education and professional training. Secondary industry did not get enough development so that there was no enough stimulation to infrastructure construction. India's industrial pattern resulted in less direct foreign investment comparing to China and the purchasing power of Indian people was not enough. Moreover, the three industries should coordinatedly develop in accordance with a certain proportion in different stages of economic growth. If the tertiary industry developed excessively without the basis of adequate development of the primary and secondary industry, the foundation of the tertiary industry would be not strong enough then would become the bottleneck of the economic development in the future.

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